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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,600	03/24/2006	James Wilson	UPN-P3230USA	6834
270 7590 03/31/2008 HOWSON AND HOWSON SUITE 210 501 OFFICE CENTER DRIVE FT WASHINGTON, PA 19034			EXAMINER EPPS FORD, JANET L	
			ART UNIT	PAPER NUMBER
			1633	
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			03/31/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/573,600

Applicant(s)

WILSON ET AL.

Examiner

Janet L. Epps-Ford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-58 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group 1, claim(s) 1-9 drawn to an adeno-associated virus (AAV) **clade E** comprising AAV8 and at least two additional AAV members.

Group 2, claim(s) 1-4, and 10-13 drawn to an adeno-associated virus (AAV) **clade D** comprising AAV7 and at least two additional AAV members.

Group 3, claim(s) 1-4, and 14-17 drawn to an adeno-associated virus (AAV) **clade B** comprising AAV2 and at least two additional AAV members.

Group 4, claims 18-21, drawn to an adeno-associated virus (AAV) **clade A**, comprising AAV1, AAV6, and at least one additional member of AAV.

Group 5, claims 22-25, drawn to an AAV **clade C** comprising A3.1/ch.5;H-6/hu.4; H-2/hu.2 and at least one further member AAV.

Group 6, claims 26-29, drawn to an adeno-associated virus (AAV) **clade F**, comprising AAV9, and at least further two member of AAV.

Group 7, claims 30-32, 43, and 45 drawn to an adeno-associated virus of serotype 9 comprising an AAV capsid and a heterologous molecule for delivery to a cell.

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Group 8, claim 33-35 drawn to a protein comprising an AAV9/HU.14 protein or a fragment thereof, an artificial adeno-associated virus capsid protein comprising said protein fragments, and a recombinant adeno-associated virus comprising said artificial capsid protein. With the election of Group 8, a further restriction from among the following groups will also be required:

- a) vpl capsid protein, amino acids (aa) 1 to 736, SEQ ID NO:123;
- b) vp2 capsid protein, aa 138 to 736, SEQ ID NO: 123 ;
- c) vp3 capsid protein, aa 203 to 736, SEQ ID NO: 123;
- d) a fragment encompassing hypervariable region (HVR)1 through 12;
- e) or a smaller fragment thereof selected from: aa 146 to 152 of SEQ ID NO: 123;
- f) aa 182 to 187;
- g) aa 262 to 264, aa 263 to 266; or aa 263 to 266;
- h) aa 381 to 383; or 383 to 385;
- i) aa 450 to 474; or aa 451 to 475;
- j) aa 490 to 495; or aa 491 to 496;
- k) aa 500 to 504; or aa 501 to 505;
- l) aa 514 to 522;
- m) aa 533 to 554; or aa 534 to 555;
- n) aa 581 to 594; or aa 583 to 596;
- o) aa 658 to 667; or aa 660 to 669;
- p) aa 705 to 719; or aa 707 to 723;
- q) aa 24 to 42, or aa 25 to 28;
- r) aa 81 to 85;
- s) aa 133 to 165; or aa 134 to 165; aa137 to 143; or aa 154 to 156;
- t) aa 194 to 208;
- u) aa 261 to 274; aa 262 to 274;
- v) aa 171 to 173;
- w) aa 185 to 198;
- x) aa 413 to 417;
- y) aa 449 to 478;
- z) aa 494 to 525;
- aa) aa 534 to 571;
- ab) aa 581 to 601;
- ac) aa 660 to 671;
- ad) aa 709 to 723;
- ae) aa 1 to 184,
- af) aa 199 to 259;
- ag) aa 274 to 446;

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- ah) aa 603 to 659;
- ai) aa 670 to 706;
- aj) aa 724 to 736;
- ak) aa 185 to 198;
- al) aa 260 to 273;
- am) aa 447 to 477;
- an) aa 495 to 602;
- ao) aa 603 to 659;
- ap) aa 660 to 669;
- aq) aa707 to 723;

wherein the amino acid numbers are those of the AAV2 capsid, SEQ ID NO:4 and corresponding regions in the capsid of AAV9/HU.14, SEQ ID NO:123.

Therefore with the election of group 8, a further election from among groups a) through aq) would also be required.

Group 9, claims 36-42, 44, and 54 (claims 41 and 54 are identical) drawn to a molecule comprising a nucleic acid sequence encoding a protein according to claim 34, selected from:

- a) a nucleic acid sequence selected from vp1, nt 1 to 2211;
 - b) a nucleic acid sequence selected from vp2, nt 2532 to 2211, and
 - c) a nucleic acid sequence selected from vp 3, nt 2730 to 2211 ;
- wherein the nucleotides numbers are of AAV9/HU.14, SEQ ID NO: 3.

Therefore with the election of group 9, a further election from among groups a)-c) would also be required.

Group 10, claims 46-49, 56 and 58 drawn to a non-naturally occurring AAV comprising an AAV capsid, and a method of delivering a transgene into a cell.

With the election of group 11 a further restriction from among the plurality of the following SEQ ID NOs will also be required, wherein said non-naturally occurring adeno-associated virus (AAV) comprising an AAV capsid having an amino acid sequence selected from the group consisting of:

30.10/pi.1 (SEQ ID NO: 93); 30.12/pi.2 (SEQ ID NO: 95); 30.19/pi.3 (SEQ ID NO: 94); LG-4/rh.38 (SEQ ID No: 86); LG-I 0/rh.40 (SEQ ID No: 92); N721-8/rh.43 (SEQ ID No: 163);1-8/rh.49 (SEQ ID NO: 103); 2-4/rh.50 (SEQ ID No: 108); 2- 5/rh.51 (SEQ ID No: 104); 3-9/rh.52 (SEQ ID No: 96); 3-11/rh.53 (SEQ

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ID NO: 97); 5- 3/rh.57 (SEQ ID No: 105); 5-22/rh.58 (SEQ ID No: 58); 2-3/rh.61 (SEQ ID NO: 107); 4- 8/rh.64 (SEQ ID No: 99); 3.1/hu.6 (SEQ ID NO: 84); 33.12/hu.17 (SEQ ID NO: 83); 106.1/hu.37 (SEQ ID No: 88); LG-9/hu.39 (SEQ ID No: 102); 114.3/hu. 40 (SEQ ID No: 87); 127.2/hu.41 (SEQ ID NO: 91); 127.5/hu.42 (SEQ ID No: 85); hu. 66 (SEQ ID NO: 197); modified rh.2 (SEQ ID NO:231); and hu.67 (SEQ ID NO: 198) from Clade E; 2-15/rh.62 (SEQ ID No: 114); 1-7/rh.48 (SEQ ID No: 115); 4-9/rh.54 (SEQ ID No: 116); and 4-19/rh.55 (SEQ ID No: 117); modified cy. 5 (SEQ ID NO: 227); modified rh. 13 (SEQ ID NO: 228); and modified rh. 37 (SEQ ID NO: 229) from the clade D; 52/hu.19 (SEQ ID NO: 133), 52.1/hu.20 (SEQ ID NO: 134), 54.5/hu.23 (SEQ ID No: 137), 54.2/hu.22 (SEQ ID No: 138), 54.7/hu.24 (SEQ ID No: 136), 54.1/hu.21 (SEQ ID No: 135), 54.4R/hu.27 (SEQ ID No: 140); 46.2/hu.28 (SEQ ID No: 130); 46.6/hu.29 (SEQ IDNo: 132); modified hu. 29 (SEQ IDNO: 225); 172.1/hu.63 (SEQ IDNO: 195); 172.2/hu. 64 (SEQ ID NO: 196); 24.5/hu.13 (SEQ ID NO: 129); 145.6/hu.56 (SEQ ID NO: 192); hu.57 (SEQ ID No: 193); 136.1/hu.49 (SEQ ID NO: 189); 156.1/hu.58 (SEQ ID NO: 194); 72.2/hu.34 (SEQ ID NO: 125); 72.3/hu.35 (SEQ ID NO: 164); 129. I/hu.45 (SEQ ID NO: 127); 130.1/hu.47 (SEQ IDNO: 128); 140.1/hu.51 (SEQ ID NO: 190); and 140.2/hu.52 (SEQ ID NO: 191) from clade B; 128.1/hu. 43 (SEQ ID Nos: 160); modified hu. 43 (SEQ ID NO: 236); 128.3/hu. 44 (SEQ ID Nos: 158); hu.46 (SEQ ID NO: 159); modified hu.46 (SEQ ID NO: 224); and 130.4/hu.48 (SEQ ID NO: 157) from Clade A; 3.1/hu.9 (SEQ ID Nos: 155); 16.8/hu.10 (SEQ ID Nos: 156); 16.12/hu.11 (SEQ ID Nos: 153); 145.1/hu.53 (SEQ ID No: 186); 145.6/hu.55 (SEQ ID No: 187); J45.5/hu.54 (SEQ ID No: 188); 7.3/hu.7 (SEQ ID No: 150); modified hu. 7 (SEQ ID NO: 226); 33.4/hu. 15 (SEQ ID No: 147); 33.8/hu.16 (SEQ ID No: 148); 58.2/hu.25 (SEQ ID No: 146); 161.10/hu.60 (SEQ ID No: 184); H-5/hu.3 (SEQ ID No: 145); H-1/hu.I (SEQ ID No: 144); hu.18 (SEQ ID NOs: 52 and 149); and 161.6/hu.61 (SEQ ID No: 185) from Clade C; hu.31 (SEQ IDNO: 121) and hu.32 (SEQ IDNo: 122) from Clade F; and rh.59 (SEQ ID NO: 110) and rh.60 (SEQ ID NO: 120); or a unique, functional fragment thereof.

Group 11, claims 50-53, 55, and 57 drawn to a molecule comprising a heterologous nucleic acid sequence encoding an AAV capsid protein, and a functional AAV rep protein, wherein said molecule is a plasmid, and a method of producing a recombinant AAV using said nucleic acid, a host cell transfected with a molecule of claim 50.

With the election of group 11 a further restriction among the various nucleic acid molecules encompassed by the claims would also be required from among the following sequences:

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30.10/pi.1 (SEQ ID NO: 28), 30.12/pi.2 (SEQ ID NO: 30), 30.19/pi.3 (SEQ ID NO: 29), LG-4/rh.38 (SEQ ID No: 7); LG-10/rh.40 (SEQ ID No: 14); N721-8/rh.43 (SEQ ID No: 43); 1-8/rh.49 (SEQ ID NO: 25); 2-4/rh.50 (SEQ ID No: 23); 2-5/rh.51 (SEQ ID No: 22); 3-9/rh.52 (SEQ ID No: 18); 3-11/rh.53 (SEQ ID NO: 17); 5- 3/rh.57 (SEQ ID No: 26); 5-22/rh.58 (SEQ ID No: 27); modified rh. 58 (SEQ ID NO: 232); 2-3/rh.61 (SEQ ID NO: 21); 4-8/rh.64 (SEQ ID No: 15); 3.1/hu.6 (SEQ ID NO: 5); 33.12/hu.17 (SEQ ID NO:4); 106.1/hu.37 (SEQ ID No: 10); LG-9/hu.39 (SEQ ID No: 24); 114.3/hu. 40 (SEQ ID No: 11); 127.2/hu.41 (SEQ ID NO:6); 127.5/hu.42 (SEQ ID No: 8); hu. 66 (SEQ ID NO: 173); modified rh.2 (SEQ ID NO:231); and hu.67 (SEQ ID NO: 174) from Clade E; 2-15/rh.62 (SEQ ID No: 33); 1-7/rh.48 (SEQ ID No: 32); 4- 9/rh.54 (SEQ ID No: 40); and 4-19/rh.55 (SEQ ID Nos: 37 and 117); modified cy. 5 (SEQ ID NO: 227); modified rh.13 (SEQ ID NO: 228); and modified rh. 37 (SEQ ID NO: 229) from Clade D; 52/hu.19 (SEQ ID NOs: 62 and 133), 52.1/hu.20 (SEQ ID NOs: 63 and 134), 54.5/hu.23 (SEQ ID No: 60), 54.2/hu.22 (SEQ ID No: 67), 54.7/hu.24 (SEQ ID No: 66), 54.1/hu.21 (SEQ ID No: 65), 54.4R/hu.27 (SEQ ID No: 64); 46.2/hu.28 (SEQ ID No: 68); 46.6/hu.29 (SEQ ID No: 69); modified hu. 29 (SEQ ID NO: 225); from Clade B; 128.11hu. 43 (SEQ ID No: 80); 128.3/hu. 44 (SEQ ID No: 81); hu.46 (SEQ ID NOs: 82) and 130.4/hu.48 (SEQ ID NO: 78) from Clade A; 3.1/hu.9 (SEQ ID No: 58); | 6.8/hu.1 0 (SEQ ID No: 56); 16.12/hu. 1 1 (SEQ ID No: 57); 145. 1/hu.53 (SEQ ID No: 176); 145.6/hu.55 (SEQ ID No: 178); 145.51hu.54 (SEQ ID No: 177); 7.3/hu.7 (SEQ ID No: 55); modified hu.7 (SEQ ID No: 226); 33.41hu. 15 (SEQ ID No: 50); 33.8/hu. 16 (SEQ ID No: 5 1); 58.21hu.25 (SEQ ID No: 49); 161.10/hu.60 (SEQ ID No: 170); H-5/hu.3 (SEQ ID No: 44); hu. 18 (SEQ ID NO: 149); H-1/hu.1 (SEQ ID No: 46); and 161.6/hu.61 (SEQ ID No: 174) from Clade C; hu.14/AAV9 (SEQ ID No: 3), hu.31 (SEQ ID NO:1)and hu.32 (SEQ ID No: 2) from Clade F; rh.59 (SEQ ID NO: 49) and rh.60 (SEQ ID NO: 31); or a unique, functional fragment thereof.

2. The inventions listed as Groups 1-11 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

3. 37 CFR § 1.475(b)-(d) state the following:

(b) An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

(1) A product and a process specially adapted for the manufacture of said product; or

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- (2) A product and process of use of said product; or
- (3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or
- (4) A process and an apparatus or means specifically designed for carrying out the said process; or
- (5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.
- (c) If an application contains claims to more or less than one of the combinations of categories of invention set forth in paragraph (b) of this section, unity of invention might not be present.
- (d) If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the main invention in the claims, see PCT Article 17(3)(a) and § 1.476(c).

4. Groups 1-11 are drawn to a plurality of structurally distinct products, methods of making and making of using said products. Groups 1-11 are drawn to numerous structurally distinct products, see for example the plurality of structurally distinct AAV capsid proteins encompassed by Group 10, and the plurality of patentably distinct molecules comprising a heterologous nucleic acid encoding an AAV capsid protein encompassed by Group 11. Since it is clear that Groups 1-11 are drawn to more than one category of invention, as per 37 CFR § 1.475(c) above, Groups 1-11 therefore are considered to lack unity of invention since these groups are drawn to more of one of the combinations of categories of invention listed in 1.475(b). Moreover, the search and examination of all Groups 1-11 together would result in an undue search burden due to the need to search the numerous amino acid and nucleic acid sequences encompassed by the instant claims.

5. Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the

requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janet L. Epps-Ford whose telephone number is 571-272-0757. The examiner can normally be reached on M-F, 10:00 AM through 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach can be reached on 571-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Janet L. Epps-Ford/
Primary Examiner, Art Unit 1633

JLE

Application Number**Application/Control No.**

10/573,600

Examiner

Janet L. Epps-Ford

**Applicant(s)/Patent under
Reexamination**

WILSON ET AL.

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